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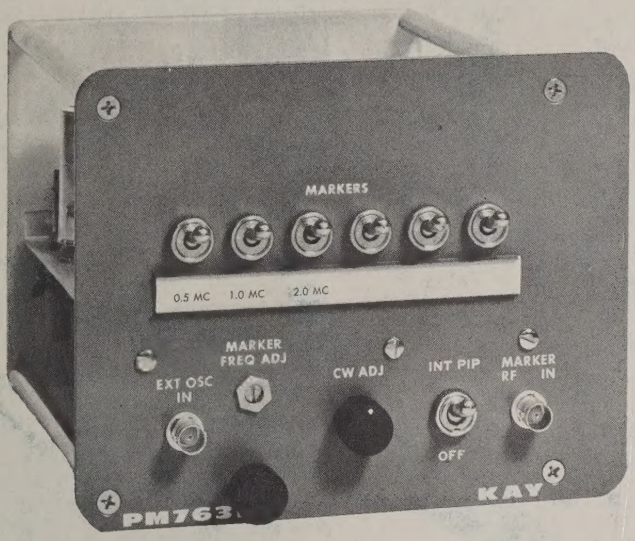

MARKER GENERATOR

PLUG-IN UNITS

Models PM-7631A and

PM-7632A

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SECTION I, GENERAL INFORMATION

I-1 INTRODUCTION.

The PM-7631A and PM-7632A marker plug-in units are compatible with Kay sweeping oscillator and marker generator instruments, such as the Marka-Sweep Model Pi. Up to six fixed markers are available and may be used all at once or one at a time. A variable frequency marker may also be developed through use of an external c-w generator. Marker frequency range for the PM-7631A is 10 kc to 2 mc, and 1 kc to 1 mc for the PM-7632A. The PM-7632A head is especially useful for applications requiring marker separation as close as 1 kc. Power and driving signals for the marker plug-in are furnished by the rack unit.

I-2 SHIPPING DAMAGE.

As soon as the marker plug-in is received, it should be visually inspected to determine that it was not damaged during shipment. A careful check of packing case contents should be made to insure removal of all items shipped. Shortage or damage should be reported immediately to the Carrier and Kay Electric Company, or its representative in the area.

A. Equipment Supplied. The marker heads are shipped completely assembled and ready for installation in a compatible basic rack unit. Other auxiliary equipment and interconnecting cables referred to in these instructions are not furnished.

I-3 SPECIFICATIONS, Model PM-7631A (When used in Model Pi rack).

Frequency Range: 10 kc to 2 mc

Fixed Markers: Up to 6, crystal-positioned, pulse-type markers, useable singly or collectively.

Fixed Marker Frequencies: As specified, or with 3 standard markers at 0.5, 1 and 2 mc.

Marker Spacing: Approx. 10 kc min.

Variable Marker: Provision for variable pulse-type marker developed through use of external c-w generator.

Marker Amplitude: Positive pulse, variable from 0 to approx. 10 volts peak.

Dimensions: 8-1/8"d x 7-5/8"w x 6"h.

Weight: 4 lbs.

I-4 SPECIFICATIONS, Model PM-7632A (When used in Model Pi rack).

Frequency range: 1 kc to 1 mc

Fixed Marker Frequencies: Marker frequencies may be specified within the nominal ranges of 1 kc - 350 kc, 300 kc - 750 kc, or 550 kc - 1 mc.

Marker Spacing: Approx. 1 kc min.

All other specifications same as Model PM-7631A.

SECTION II, OPERATION

2-1 INTRODUCTION.

General operating instructions are furnished in the instruction manual provided with the basic rack unit(s) in which the PM-7631A and PM-7632A Marker Plug-in heads may be used. Specific identification and function of only those controls and terminals physically located on the marker heads are discussed here. However, since these controls and terminals have a direct relationship to those on the basic rack, both manuals should be referred to.

A. Installation of the marker plug-in in the rack unit is accomplished by pushing the plug-in into the receiving well as far as it will go. To lock the plug-in in place, turn the locking screw clockwise until it is tight. The plug-in may be removed from the rack unit by turning the locking screw counterclockwise to release it from the rack, and pulling the plug-in free.

2-2 CONTROLS AND TERMINALS (Front Panel).

CONTROL	POSITION	FUNCTION
MARKERS Switches S-1 thru S-6	ON - OFF	Used to insert frequency markers on CRO trace, either singly or collectively. Markers are active when switches are in UP position.
CW ADJ Pot. R-22 (R-26, PM-7632A)	Variable	Used to adjust amplitude of variable marker trigger, Should be set at the lowest ccw setting which provides a stable variable marker pulse.
MARKER FREQ ADJ (Screwdriver adjustable) C-34 (R-37, PM-7632A)	Variable	Used to maximize marker accuracy at selected sweep widths or rep rates.
TRIG ADJ (Screwdriver adjustable) R-32 (R-31, PM-7632A)	Variable	Used to adjust amplitude of trigger pulse, and stabilize lowest frequency marker. (May be necessary to make adjustment when switching between Log and Lin modes.)
INT PIP Switch S-7 (Located at rear of chassis, Defense Electronics units.)	OFF - ON	Used to activate circuits in rack and sweep head to produce internal markers which 'notch' the detected sweep trace at frequencies denoted for S-1 thru S-6.

TERMINAL	FUNCTION
EXT OSC IN jack J-2	Output from external c-w generator is applied here to develop a variable marker. Requires 1V rms into 70 ohms.
MARKER RF IN jack J-1	Swept r-f from sweep plug-in is applied here.

2-3 GENERAL OPERATING INSTRUCTIONS.

It is assumed that the marker head is fully seated in its receiving well in the rack unit, and that a coaxial patch cord has been connected between the Marker RF In jack on the marker head and Marker RF Out jack on the sweep head. Fig. 2-1.

Controls on the rack unit, sweep head and CRO should be adjusted (as described in the manual for the basic rack) to obtain a stable, detected sweep trace on the CRO screen.

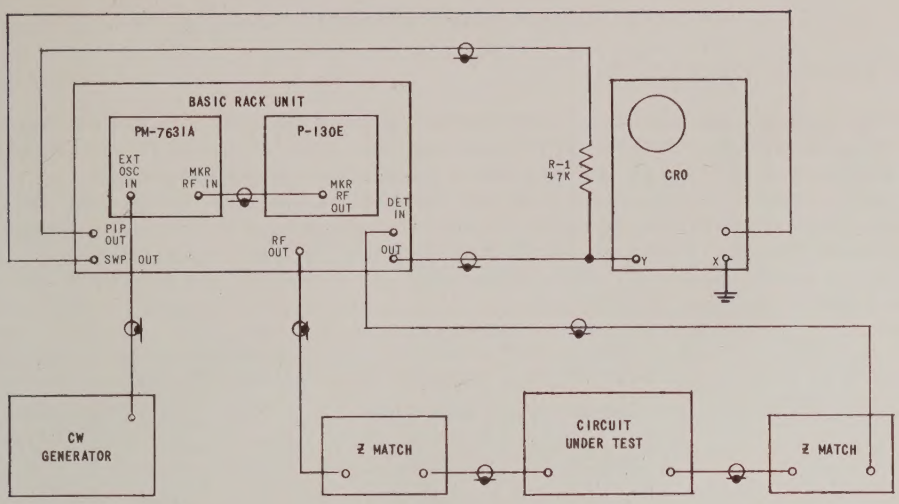


Fig. 2-1 Typical interconnection of equipment, using P-130A sweep head and PM-7631A marker head. Isolating resistor R-1 should be located as close as possible to the CRO Y-input terminal. The c-w generator is only required when a variable marker is needed. Use of impedance matching devices will depend on characteristics of circuit under test.

Markers at frequencies within the swept range in use may be superimposed on the trace by setting appropriate Marker switches to the UP position. Marker-pip stability and amplitude may be adjusted by appropriately setting the Pip Adjust and Pip Level controls on the rack unit. To insure maximum marker frequency accuracy the Pip Adjust control should be set to lowest setting (ccw) providing stable marker pulses.

Sweep width and rep rate effect marker accuracy and stability and it may be necessary to reset the Pip Adjust and Marker Freq Adj controls when width or rate is changed. A marker shift of approximately 400 cps can be expected when switching the rep rate from line lock to 0.2 cps.

The markers are adjusted at the plant for maximum accuracy at approximately 20-kc sweep width and rates below 10 cps (PM-7631A). Optimum accuracy for the PM-7632A is checked out at a frequency corresponding to three times the minimum marker spacing, and will depend on the marker frequencies specified by the customer. If it is desired to achieve maximum marker accuracy at other sweep widths and rep rates, this can be accomplished by selecting a new setting for the screwdriver-adjustable Marker Frequency Adjust control located on the panel. (See Maintenance Section for further instructions.)

If a variable marker is desired, the output from an external c-w generator should be applied to the Ext Osc In jack, as in Fig. 2-1. The generator should be capable of furnishing 1 volt rms into 70 ohms. Amplitude of the variable marker trigger is adjustable with the CW Adjust control, or by varying the amplitude of the cw directly at the generator. The lowest setting which provides a stable marker pulse should be used. Frequency is read directly on the c-w generator tuning dial when the PM-7631A is used. When the PM-7631A marker head is used, it is necessary to add 500 cycles to the dial reading.

3-1 OVER-ALL CIRCUIT DESCRIPTION.

The major circuits comprising the PM-7631A and PM-7632A marker plug-in units are shown in Fig. 3-1. Heterodyne techniques are used to develop crystal-positioned fixed marker pips, and a variable frequency marker. Development of the fixed markers will be described first, and is based on the assumption that the PM-7631A marker head and P-130E sweep head are being used in the rack unit. Specific frequencies mentioned in the discussion will not hold if any other combination of plug-in units are used, however, the principle of circuit operation will be essentially the same.

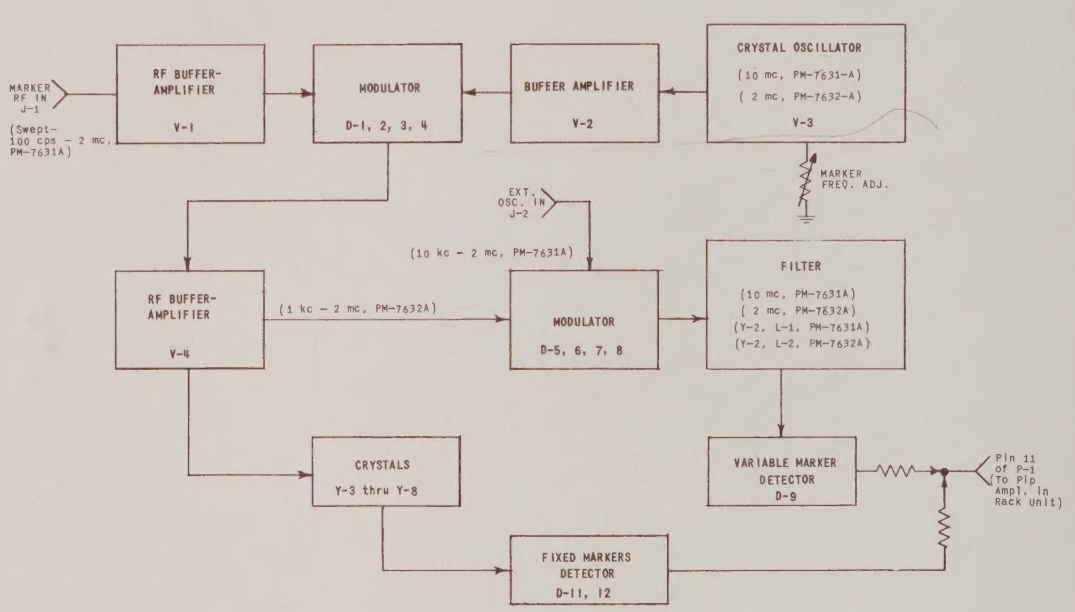

MARKER RF IN J-1
(Swept- 100 cps - 2 mc, PM-7631A)
RF BUFFER-AMPLIFIER V-1
MODULATOR D-1, 2, 3, 4
BUFFER AMPLIFIER V-2
CRYSTAL OSCILLATOR (10 mc, PM-7631-A) (2 mc, PM-7632-A) V-3
MARKER FREQ. ADJ.
EXT. OSC. IN J-2
(10 kc - 2 mc, PM-7631A)
RF BUFFER-AMPLIFIER V-4
(1 kc - 2 mc, PM-7632A)
MODULATOR D-5, 6, 7, 8
FILTER (10 mc, PM-7631A) (2 mc, PM-7632A) (Y-2, L-1, PM-7631A) (Y-2, L-2, PM-7632A)
CRYSTALS Y-3 thru Y-8
VARIABLE MARKER DETECTOR D-9
Pin 11 of P-1 (To Pip Ampl. in Rack unit)
FIXED MARKERS DETECTOR D-11, 12

Fig. 3-1, Block Diagram showing relationship of major circuits, PM-7631A, PM-7632A.

A. Fixed Markers. A swept frequency signal (within the range of 100 cps to 2 mc) is applied to Marker RF In jack J-1, amplified by buffer-amplifier V-1, and applied to a balanced modulator composed of D-1 thru D-4. The second input to the modulator is the 10-mc c-w output of crystal-controlled oscillator V-3, which is amplified by buffer-amplifier V-2.

Modulator output (swept sum frequencies, 10 - 12 mc) is taken from the primary winding of T-2, amplified by buffer-amplifier V-4, and applied to the primary of T-4. For fixed frequency markers, the sum frequencies are coupled out through the pick-off loop (See Schematic No. C-7627-L), and applied to the crystal bank (Y-3 thru Y-8). Marker crystals are cut 10 mc above the indicated marker frequency.

As an example, consider an 11-mc marker crystal switched into the circuit (to produce a 1 mc marker). When the sweeping 10- to 12-mc signal coincides with the 11-mc marker crystal frequency an r-f pulse is generated, detected by D-11 and coupled out through R-24, and pin 11 of P-1 to the pip amplifier in the rack unit. The marker crystals are connected in a bridge configuration, with variable capacitor C-31 in one leg. This capacitor is adjusted so that only the clean trigger pulse for the desired marker(s) appear at C-32.

Since the swept 10 - 12 mc signal is synchronized with the sawtooth output from the rack unit, and used to drive the X-axis amplifiers in the CRO, the marker appears at the center of the 100 cps - 2 mc sweep (as seen on the CRO screen), or at 1 mc.

Trigger Adjust control R-32 is used to adjust for constant amplitude of the trigger pulse from the lowest frequency marker crystal, for both linear and logarithmic sweeps.

B. Variable Marker. A variable marker is developed by applying the output from a c-w generator to the Ext Osc In jack, J-2. This c-w signal (within 10 kc - 2 mc) is coupled through the CW Adjust control (R-22) to the center-tap of T-5 in the modulator, where it is heterodyned with the 10 - 12 mc sweeping signal. The difference frequencies are coupled out to a 10-mc crystal filter composed of L-1 and Y-2.

As a typical example of the heterodyne action to develop a variable marker, consider a 1-mc c-w input at J-2, mixed with the swept 10 to 12 mc in the modulator, producing difference frequencies between 9 and 11 mc. These swept difference frequencies are coupled out to the 10-mc filter which passes an r-f pulse each time the sweeping frequencies pass 10 mc. The resultant pulse is detected by D-9, and coupled out to the pip amplifier in the rack unit.

Since the swept 10 - 12 mc input to the modulator is synchronized with the sawtooth voltage used to drive the X-axis amplifiers in the CRO, the 1-mc variable frequency marker will appear at the center of the 0 - 2 mc sweep trace on the CRO screen. Other c-w input frequencies (within the nominal range of 10 kc to 2 mc) may be used to develop a variable frequency marker, as described for the 1-mc marker. Marker frequency is read directly on the c-w generator tuning dial. (PM-7632A, add 500 cps to generator dial to obtain correct variable marker pulse frequency.)

The CW Adjust (panel control) is used to adjust the amplitude of the c-w signal applied to the modulator. This signal should be at least 1 volt rms (into 70 ohms). The CW Adjust control is set so that the marker pulse just appears with the Pip Adjust control on the rack set for normal operation of the fixed markers.

C. Internal Markers. Internal Pip Off switch S-7 is used to activate circuitry in the rack and sweep head, which produces a negative pulse which 'notches' the swept output to produce internal markers at the same frequencies as the fixed marker pips. This circuitry is described in the manual furnished with the individual sweep plug-ins.

The variable marker may be used simultaneously with the fixed positive pip markers, and with the internal markers. However, the positive pip markers and the internal markers may not be used simultaneously for practical purposes.

SECTION IV, MAINTENANCE

4-1 INTRODUCTION.

These maintenance instructions should be used in conjunction with those furnished in the manual provided with the rack unit. In order to make voltage measurements, the marker head will have to be operated removed from the rack unit. This can be accomplished by using a multiconductor cable fitted with connectors compatible with those on the rack and plug-in. (Extension Cable, Kay P/N 8085 @ $14.95.)

If instrument performance seems defective in any respect, first determine that the cause is not in the associated equipment, or in the connections between equipment. Check the B+ voltage, as instructed in the manual furnished with the rack unit and reset, if necessary, to the specified voltage. Typical voltages at check points, and waveforms, are shown on the schematic and in Tables 4-1 and 4-2, of these instructions. Location of major components is shown in Figs. 4-3 thru 4-6.

4-2 TROUBLE-SHOOTING SUGGESTIONS.

SYMPTOM	CIRCUITS TO BE CHECKED
No trigger, or low trigger amplitude.	a. V-1, 2, 3, 4; diodes D-1 thru D-4. b. Check amplitude of input signal to Marker RF Input jack J-1.
No variable marker, or unstable marker.	a. Check external c-w source. b. Check diodes D-5 thru D-8. c. Check adjustment of T-4, T-5 & L-1.
Fixed markers off frequency.	a. Check setting of Marker Frequency Adjust control, C-34 PM-7631A; R-37 PM-7632A. b. V-3 c. Check adjustment of L-2 & T-3.
Variable marker off frequency.	a. Check adjustment of T-4, T-5 & L-1.
Individual fixed marker inoperative.	a. Crystal loose in socket. b. Damaged crystal.

4-3 ALIGNMENT AND ADJUSTMENT.

A. Suggested Equipment.

1) Cathode-ray Oscilloscope.
2) Vacuum-tube Voltmeter.
3) Frequency Counter.
4) C-W Generator covering 300 kc to 2 mc.
5) 70-ohm Attenuator.
6) Extension patch cord to permit operation of the marker head outside the cabinet.

The following procedure relates specifically to the PM-7631A marker head, but procedure-wise applies as well to the PM-7632A head, except for the frequencies mentioned. Since marker frequencies for the PM-7632A are normally specified by the customer, it is not practical to cite specific frequencies. Also note that circuit symbol numbers mentioned in the procedure are for the PM-7631A, their counterparts can be determined by referring to the schematic for the PM-7632A.

B. Interconnection of Equipment.

1) Connect an extension patch cord between the marker head and rack to permit operation of the head outside the cabinet.

   a. Provide a connection between the Marker RF In jack, and Marker RF Out jack on the sweep head, using 70-ohm coaxial cable.

C. Align Crystal Oscillator V-3.

1) Connect VTVM to TP-1.

   a. Tune T-3 (oscillator tank coil) for maximum voltage at TP-1 (approximately -10v).

   b. Disconnect the VTVM.

D. Align Modulator.

1) With equipment interconnections as in B, tune T-1, T-2 and T-4 for maximum (and approximately equal) trigger output. Trigger amplitude should not be less than 0.1v.

a. Tune T-5 for maximum trigger amplitude and minimum trigger width.

E. Calibrate Fixed Markers.

1) Interconnect equipment as shown in Fig. 4-1.

NOTE. Preliminary steps for PM-7632A ONLY.

a. Connect frequency counter to output of V-2.

b. Set Marker Frequency Adjust control (R-37) fully counterclockwise and tune L-2 for approximately 1.999865 mc reading on the counter.

c. Set R-37 fully clockwise; frequency should be approx. 2.000265 mc.

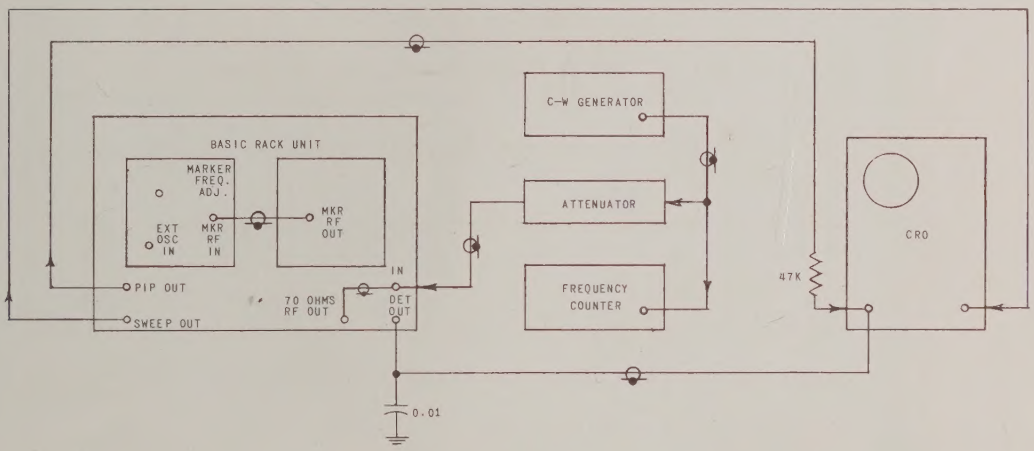


Fig. 4-1, Equipment Interconnections for Calibrating Marker Frequencies.

2) The following applies to both the PM-7631A and PM-7632A, except as noted.

a. Set the Pip Adj control (on rack unit) to lowest setting that provides stable markers.

b. Set Frequency Megacycles dial to frequency of lowest fixed marker.

c. Set Sweep Width Kilocycles switch to 20 kc (10 kc, PM-7632A).

d. Set marker switch for lowest fixed-frequency marker to ON position.

e. Set attenuator to provide suitable birdie amplitude, while providing isolation between sweeping output and counter.

f. A marker and the beat from the c-w generator should appear on screen.

On extremely low frequencies it may be necessary to connect a 0.01 uf capacitor across the detected output to bypass the audio component from the zero beat. Fig. 4-1.

g. Tune c-w generator until counter frequency is that of marker to be calibrated.

h. Set sweep rate to approximately 5 cps.

i. Set Marker Frequency Adjust control (screwdriver adjustable) to center of its range.

j. Tune L-2 (oscillator pulling adjust) so that the marker coincides with center of beat. Pip Adj control should be set at lowest setting which provides stable markers.

k. Set Sweep Selector to Line Lock and determine that Marker Frequency Adjust control has sufficient range to 'pull' the marker on frequency. Reset at 5 cps rep rate.

l. Check balance of fixed markers, as above, to determine that all are on frequency.

F. Align Variable Marker, PM-7631A.

1) Provide a connection between external c-w generator and Ext Osc In jack.

2) Set c-w generator for 1 volt rms output (into 70 ohms).

a. Set CW Adj control fully clockwise.

b. Set r-f sweep for approximately 200 kc sweep width, and set c-w generator frequency to the center frequency of the sweep.

3) Provide a connection between Y-input terminal of the CRO and pin 11 of plug-in connector rack unit.

a. Note that variable marker trigger has two peaks with a beat note appearing in the center.

b. Tune T-4 for maximum amplitude of the left-side peak (low frequency side). The right-side peak will diminish in amplitude. Fig. 4-2.

c. Tune L-1 so that beat falls in valley between the two peaks.

4) To check variable marker frequency, choose a convenient fixed marker to use as a reference.

a. Transfer the connection between attenuator and Det In jack to Ext Osc In jack. Fig. 4-1.

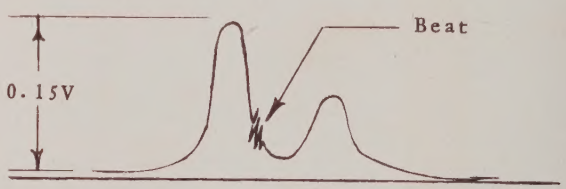


Fig. 4-2, Waveform of variable marker trigger when correctly tuned.

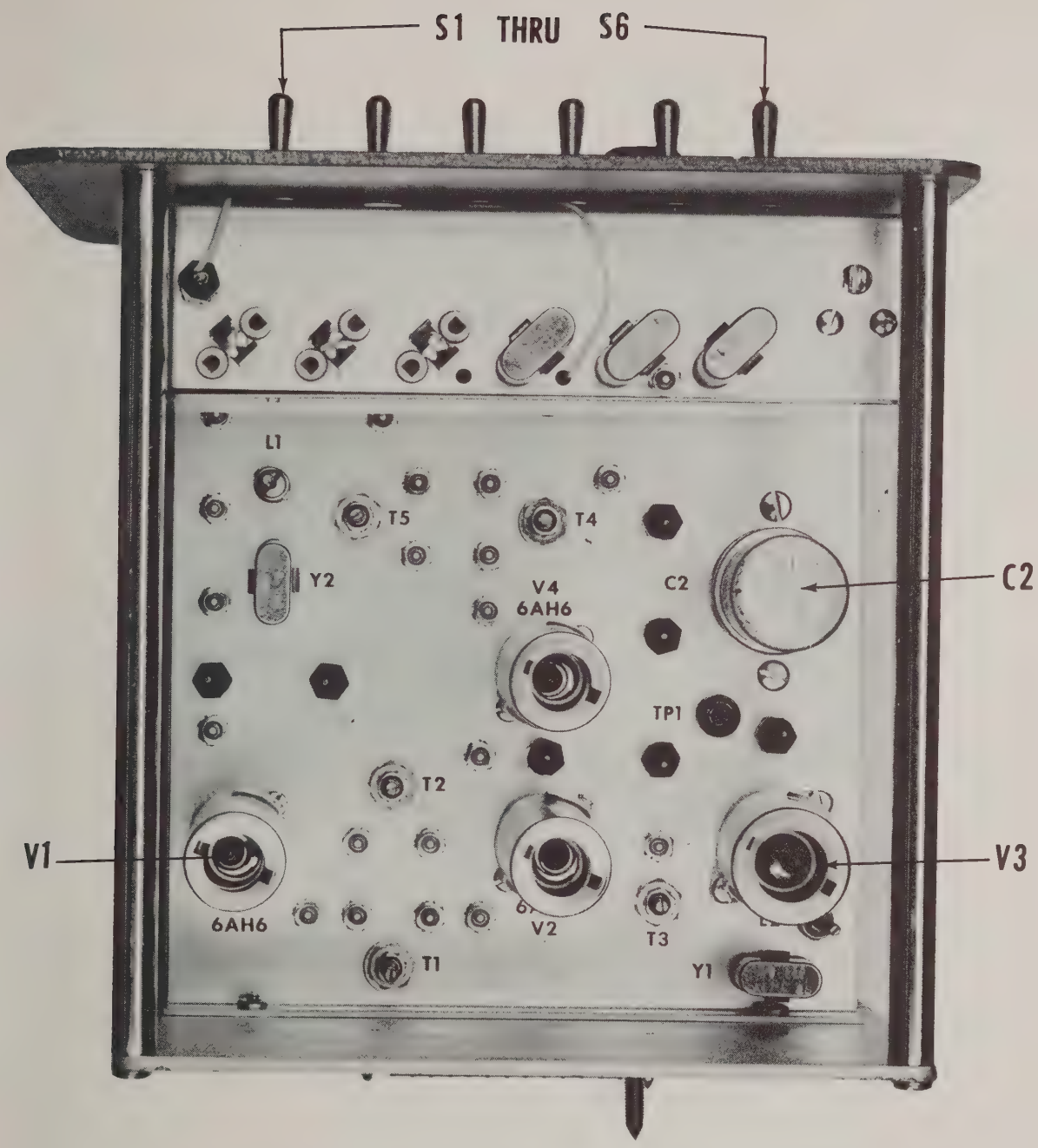
b. Remove attenuation (set attenuator for feed-thru operation).

c. Set output frequency of c-w generator to that of the reference fixed marker.

d. Mark position of the reference marker on CRO screen and switch the marker off.

e. Tune L-1 until variable marker pulse falls within approximately 1% of the fixed marker.

Care should be taken when tuning L-1 so that the beat noted in Fig. 4-2 remains on the skirt of the trigger pulse. If the beat appears on top of this trigger, the variable marker will be unstable.



PM7631A MARKER PLUG IN

Fig. 4-3 Top view of chassis, PM-7631A.

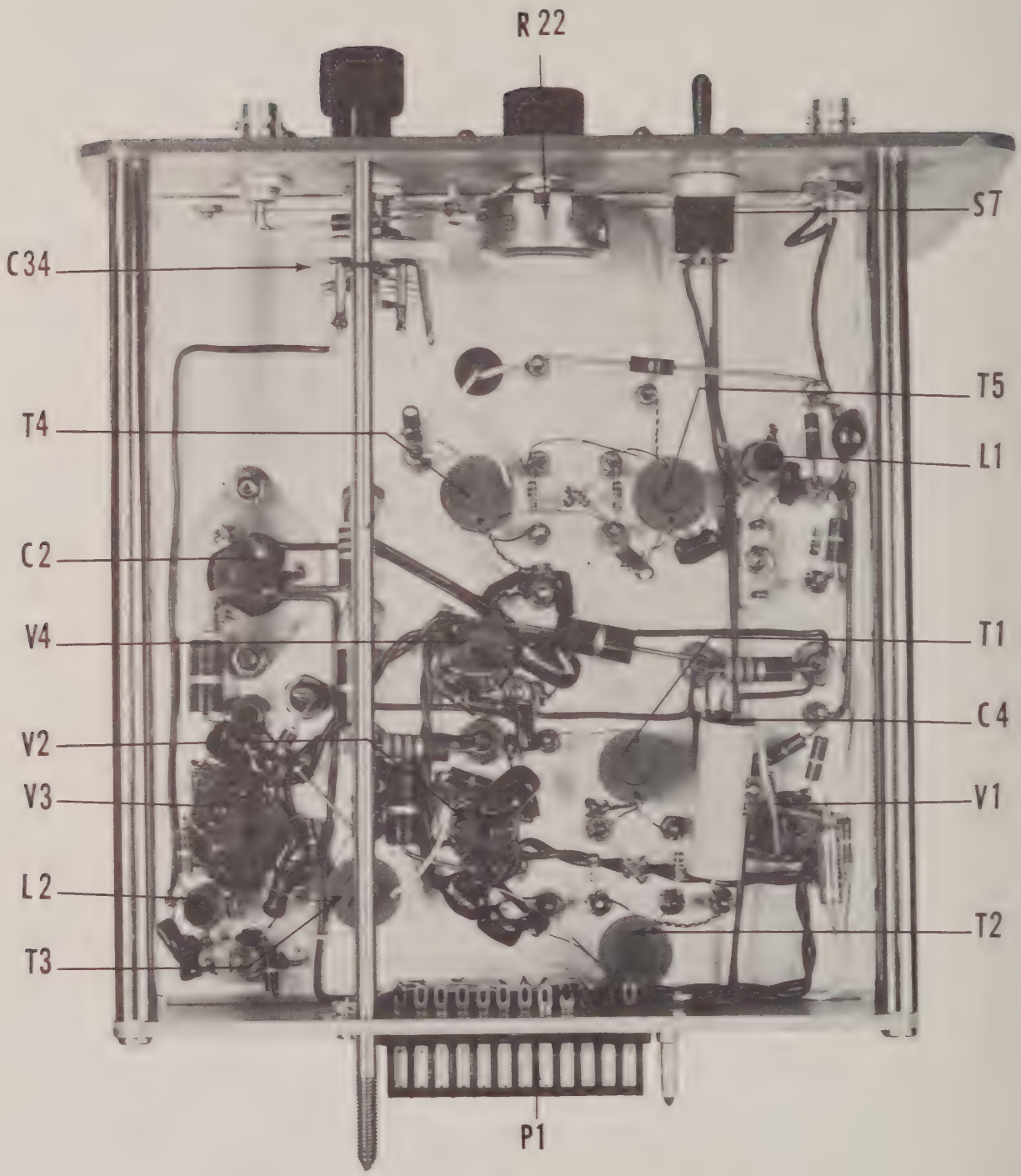
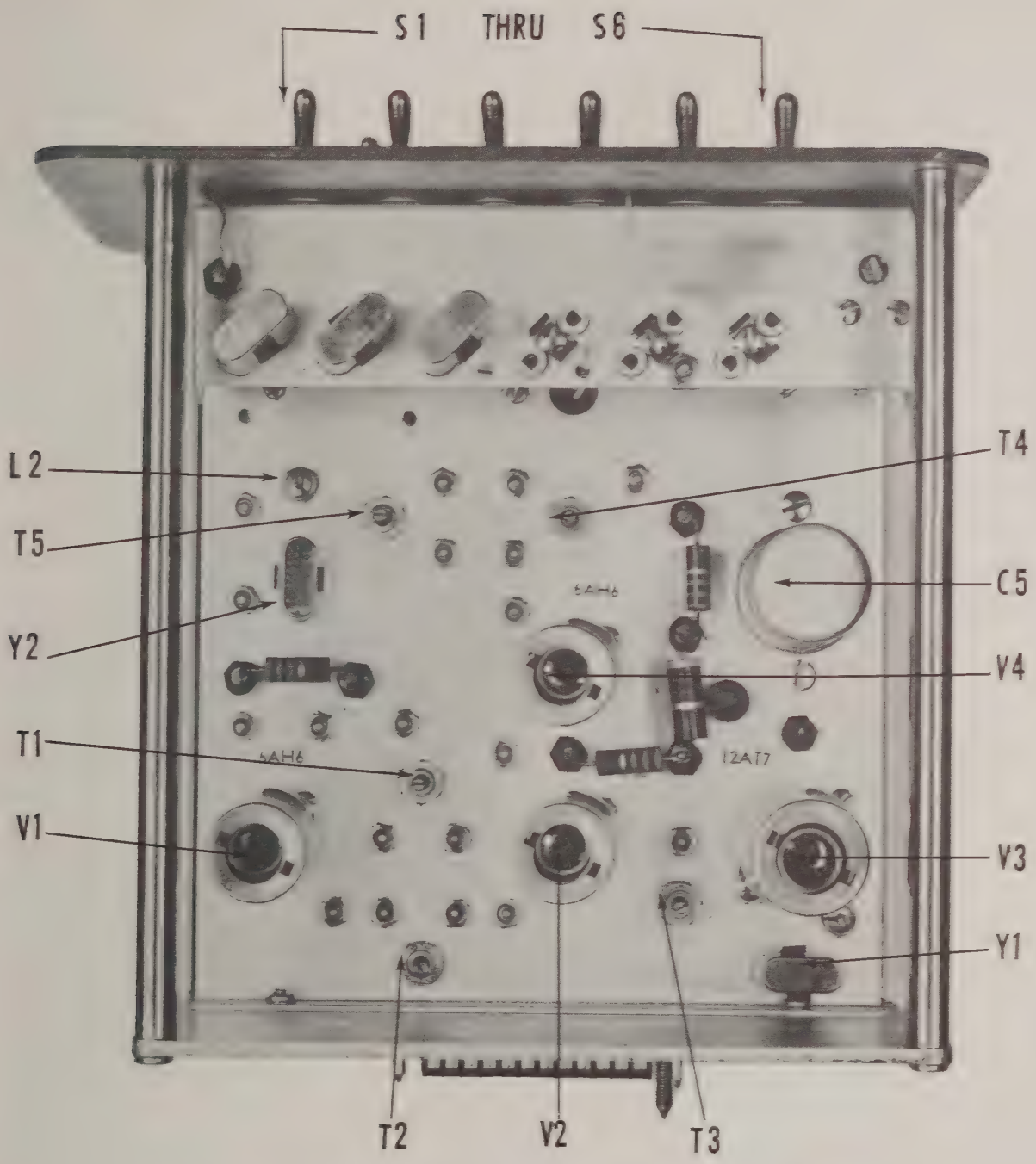
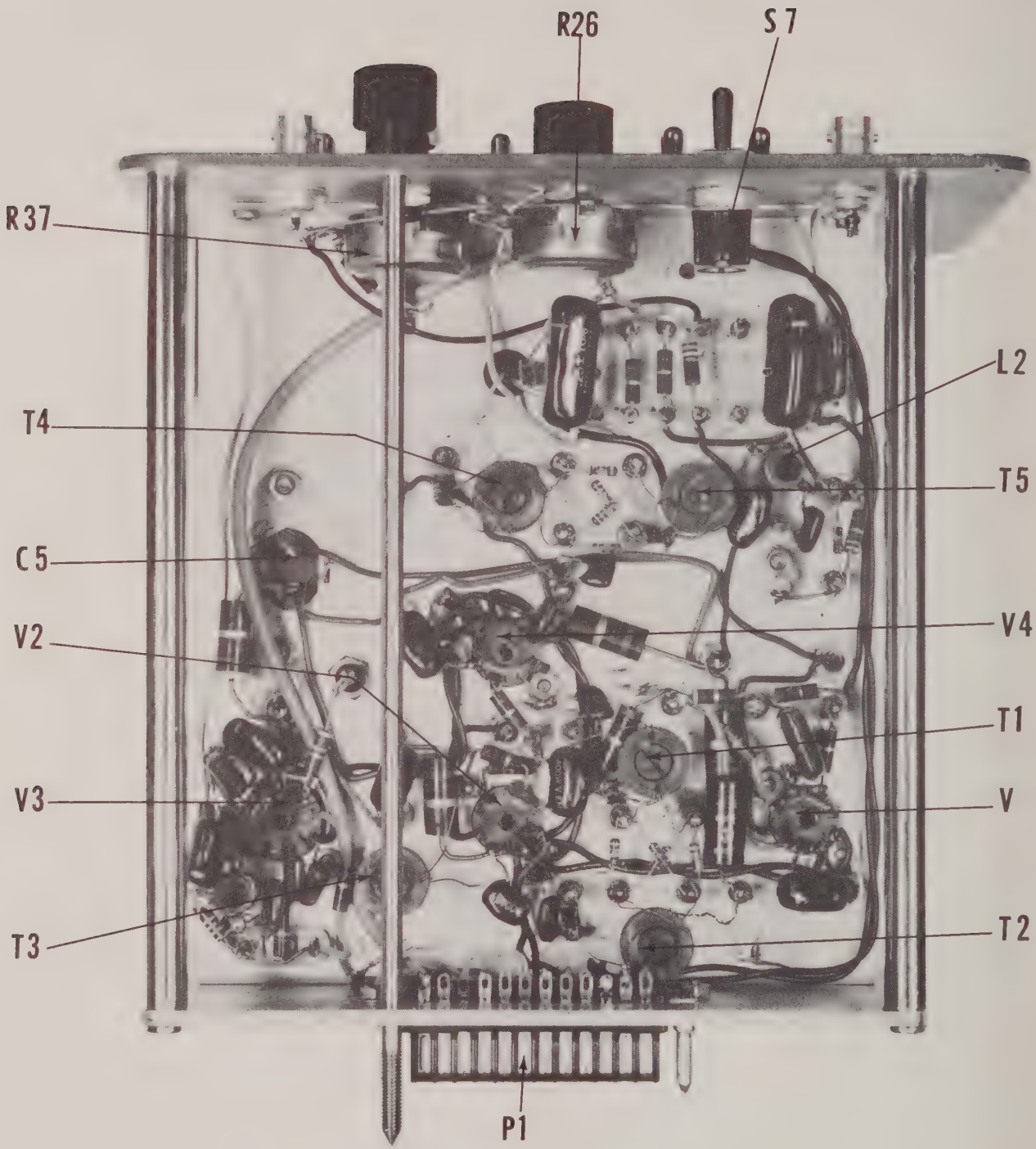


Fig. 4-4 Bottom view of chassis, PM-7631A.



PM7632A MARKER PLUG IN

Fig. 4-5 Top view of chassis, PM-7632A.



PM7632A MARKER PLUG IN

Fig. 4-6 Bottom view of chassis, PM-7632A.

G. Align Variable Marker, PM-7632A.

1) Connect external c-w generator to Ext Osc In jack. Generator should be capable of delivering 1v rms.

2) Set sweep oscillator center frequency to correspond to the c-w frequency.

   a. Set sweep width to approximately 5 kc.

3) Adjust CW Adj control from the ccw position until a stable marker pulse appears.

4) Make sure the Marker Frequency Adjust control is set for the correct fixed marker frequency.

5) Ascertain, by the method used for fixed marker calibration, that the marker pulse is approximately 500 cps higher than the generator dial setting.

6) Slight frequency adjustments are possible by retuning L-2.

H. Voltage Measurements, Model PM-7631A.

Conditions- Measurements taken with a VTVM.

TUBE DESIGNATION		SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9
V-1	6AH6	0	1.8	Fil	Fil	190	175	1.8	---	---
V-2	6AH6	0	1.6	Fil	Fil	140	115	1.6	---	---
V-3	12AT7	195	Gnd	2.0	Fil	Fil	190	-12.6*	1.8	Fil
V-4	6AH6	0	2.0	Fil	Fil	190	185	2.0	---	---
*Measured at TP-1.										

Table 4-1, Voltage Measurements at tube pins.

I. Voltage Measurements, Model PM-7632A.

Conditions- Measurements taken with a VTVM.

TUBE DESIGNATION		SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9
V-1	6AH6	0	19	Fil	Fil	190	140	19	---	---
V-3	12AT7	195	Gnd	2	Fil	Fil	190	-8*	1.8	Fil
*Measured at TP-1.										

Table 4-2, Voltage Measurements at tube pins. Remainder of voltages for the PM-7632A are the same as those for the PM-7631A in Table 4-1.

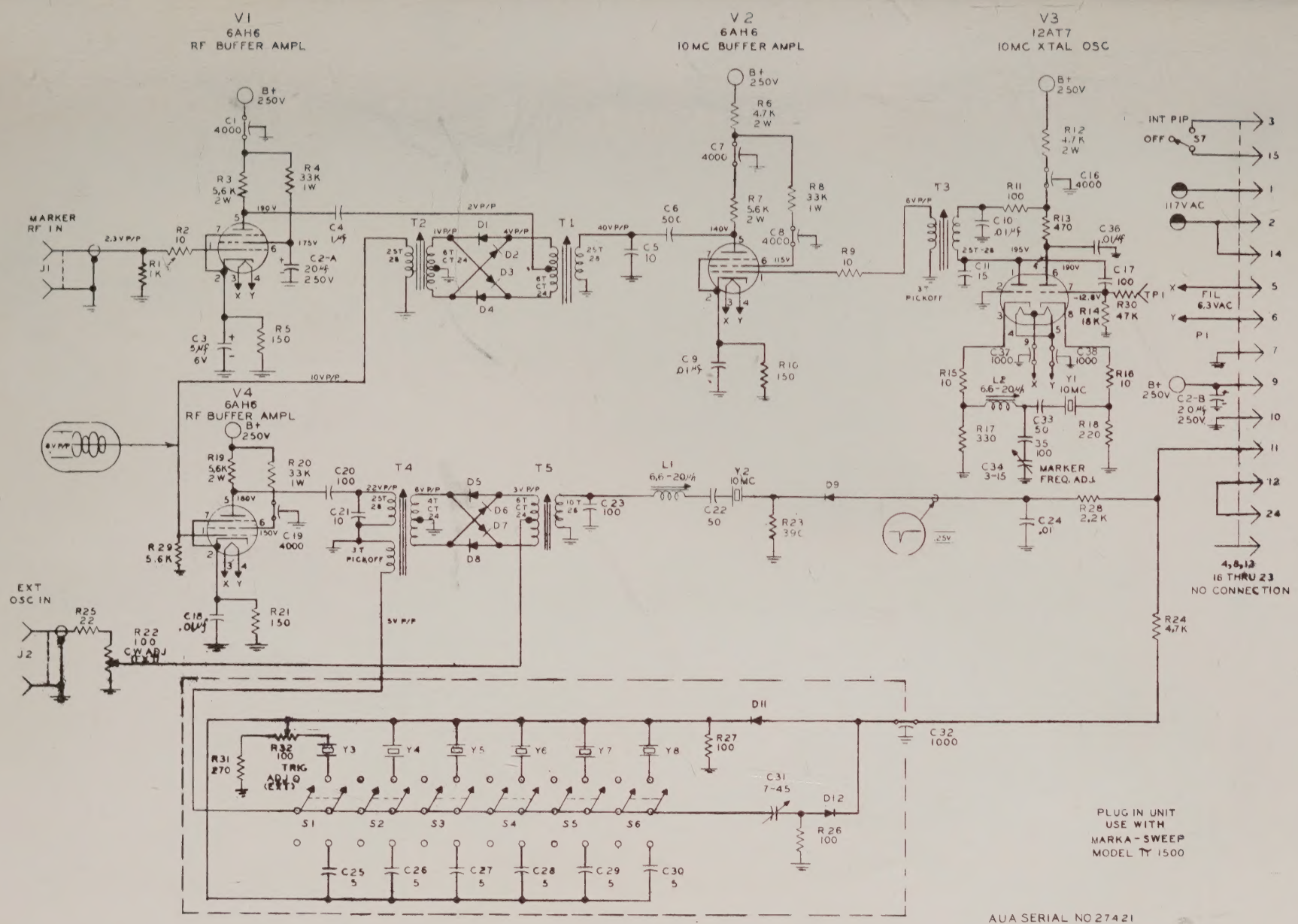
SECTION V, LISTING OF REPLACEABLE PARTS

5-1 INTRODUCTION.

To maintain new-instrument performance when repairs are made, use only exact replacement parts, which are obtainable from Kay Electric Company. Reference the instrument type, serial number and circuit symbol number when ordering replacement parts.

5-2 LISTING OF REPLACEABLE PARTS, PM-763 IA.

DWG. SYMBOL NO.	DESCRIPTION	KAY PART NO.
	Capacitors: (All capacitors in uuf, 500 volts, unless otherwise indicated.)	
C1	4000, ceramic feed thru	6356-5
C2 A & B	20/20uf, 250V, electrolytic	6355-9
C3	5uf, 6V, electrolytic	6355-70
C4	1uf, 300V, Mylar	6411-9
C5	10, silver mica	6359-53
C6	500, silver mica	6359-66
C7 & C8	4000, ceramic feed thru	6356-5
C9 & C10	0.01uf, 400V, Mylar-paper	6899-8
C11	15, silver mica	6359-55
C12 thru C15	Not used	
C16	4000, ceramic feed thru	6356-5
C17	100, silver mica	6359-46
C18	0.01uf, 400V, Mylar-paper	6899-8
C19	4000, ceramic feed thru	6356-5
C20	100, silver mica	6359-46
C21	10, silver mica	6359-53
C22	50, silver mica	6359-60
C23	100, silver mica	6359-46
C24	0.01uf, 400V, Mylar-paper	6899-8
C25 thru C30	5, silver mica	6359-52
C31	7-45, ceramic trimmer	6358-7
C32	1000, ceramic feed thru	6356-4
C33	50, silver mica	6359-60
C34	3-15, variable, air	1991
C35	100, silver mica	6359-46
C36	0.01uf, 400V, Mylar-paper	6899-8
C37 & C38	1000, ceramic feed thru	6356-4
	Diodes:	
D1 thru D12	Germanium 1N126A	6357-19
	Connectors:	
J1 & J2	Female, UG-625/U	451
P1	Male, 26-159-24	7570
	Coils:	
L1 & L2	6.6-20uh	6836
	Resistors: (Unless otherwise specified, all resistors are fixed composition, 1/2 watt, 10% tolerance.)	
R1	1K	1021-E
R2	10	1001-E
R3	5.6K, 2 watts	5621-H
R4	33K, 1 watt	3331-G
R5	150	1511-E
R6	4.7K, 2 watts	4721-H
R7	5.6K, 2 watts	5621-H
R8	33K, 1 watt	3331-G
R9	10	1001-E
R10	150	1511-E
R11	100	1011-E
R12	4.7K, 2 watts	4721-H
R13	470	4711-E
R14	18K	1831-E
R15 & R16	10	1001-E
R17	330	3311-E
R18	220	2211-E
R19	5.6K, 2 watts	5621-H
R20	33K, 1 watt	3331-G
R21	150	1511-E
R22	100, 2 watt pot, variable	90
R23	390	3911-E
R24	4.7K	4721-E
R25	22	2201-E
R26 & R27	100	1011-E
R28	2.2K	2221-E
R29	5.6K	5621-E
R30	47K	4731-E
R31	270	2711-E
R32	100, pot, variable	7240
	Switches:	
S1 thru S6	Toggle, DPDT	254-TX
S7	Toggle, SPST	255-A
	Transformers:	
T1	Slug-tuned	T1/7627L
T2	" "	T2/7627L
T3	" "	T3/7627L
T4	" "	T4/7627L
T5	" "	T5/7627L
	Test Jacks:	
TP-1	#9462	7581
	Electron Tubes:	
V1 & V2	6AH6	6AH6
V3	12AT7	12AT7
V4	6AH6	6AH6
	Crystals, Quartz	
Y1	10.0 mc	Y1/10 mc
Y2	10.0 mc	Y2/10 mc
Y3 thru Y8	Crystal frequencies are in accordance with customer specifications.	



UNLESS INDICATED OTHERWISE
ALL RESISTANCES ARE IN OHMS 1/2 W
ALL CAPACITANCES ARE IN μμf

Fig. 5-1 PM-7631A SCHEMATIC, C-7627L

5-3 LISTING OF REPLACEABLE PARTS, PM-7632A.

DWG. SYMBOL NO.	DESCRIPTION	KAY PART NO.
	Capacitors: (All capacitors in uuf, 500 volts, unless otherwise indicated.)	
C1	0.22uf, 50V, Mylar	6411-1
C2	0.01uf, 400V, Mylar-paper	6899-8
C3	4000, ceramic feed thru	6356-5
C4	0.22uf, 50V, Mylar	6411-1
C5 A & B	20/20uf, 250V, electrolytic	6355-9
C6	50uf, 15V, electrolytic	6355-43
C7	39, silver mica	6359-59
C8	75, silver mica	6359-61
C9	500, silver mica	6359-66
C10 & C11	4000, ceramic feed thru	6356-5
C12 & C13	0.01uf, 400V, Mylar-paper	6899-8
C14	100, silver mica	6359-46
C15	4000, ceramic feed thru	6356-5
C16	0.01uf, 400V, Mylar-paper	6899-8
C17	100, silver mica	6359-46
C18 & C19	1000, ceramic feed thru	6356-4
C20	39, silver mica	6359-59
C21	33, varicap	8513
C22	0.01uf, 400V, Mylar-paper	6899-8
C23 & C24	4000, ceramic feed thru	6356-5
C25	0.01uf, 400V, Mylar-paper	6899-8
C26	500, silver mica	6359-66
C27	62, silver mica	6359-77
C28	0.001uf, 600V, Mylar-paper	6899-10
C29	82, silver mica	6359-72
C30	0.25uf, 100V, Mylar-paper	6899-20
C31 thru C36	5, silver mica	6359-52
C37	7-45, ceramic trimmer	6358-7
C38	1000, ceramic feed thru	6356-4
C39	0.25uf, 400V, Mylar-paper	6899-3
	Diodes:	
D1 thru D11	Germanium, 1N126A	6357-19
	Connectors:	
J1 & J2	Female, UG-625/U	451
P1	Male, 26-159-24	7570
	Coils:	
L1 & L2	Crest #5, 33-110uh	6838
	Resistors: (Unless otherwise specified, all resistors are fixed composition, 1/2 watt, 10% tolerance.)	
R1	1K	1021-E
R2	10	1001-E
R3	4.7K, 2 watts	4721-H
R4	33K, 1 watt	3331-G
R5	4.7K	4721-E
R6	150	1511-E
R7	1K, 1 watt	1021-G
R8	5.6K, 2 watts	5621-H
R9	4.7K, 2 watt	4721-H
R10	33K, 1 watt	3331-G
R11	150	1511-E
R12	10	1001-E
R13	470	4711-E
R14	100	1011-E
R15	4.7K, 2 watts	4721-H
R16	18K	1831-E
R17	47K	4731-E
R18	10	1001-E
R19	330	3311-E
R20	10	1001-E
R21	220	2211-E
R22	5.6K	5621-E
R23	5.6K, 2 watts	5621-H
R24	33K, 1 watt	3331-G
R25	150	1511-E
R26	100, 2 watt pot, variable	90
R27	22	2201-E
R28	330	3311-E
R29	2.7K	2721-E
R30	4.7K	4721-E
R31	100, ½ watt pot, variable	7240
R32	270	2711-E
R33 & R34	330	3311-E
R35	33K	3331-E
R36	330K	3341-E
R37	25K, 2 watt pot, variable	113
R38	1.5K	1521-E
	Switches:	
S1 thru S6	Toggle, DPDT	254-TX
S7	Toggle, SPST	255-A
	Transformers:	
T1	Slug-tuned	T1/8361B
T2	" "	T2/8361B
T3	" "	T3/8361B
T4	" "	T4/8361B
T5	" "	T5/8361B
	Test Jacks:	
TP1	#9462	7581
	Electron Tubes:	
V1 & V2	6AH6	6AH6
V3	12AT7	12AT7
V4	6AH6	6AH6
	Crystals, Quartz	
Y1	2 mc	Y1/2 mc
Y2	2.00050 mc	Y2/2.00050MC
Y3 thru Y8	Crystal frequencies are in accordance with customer specifications.	

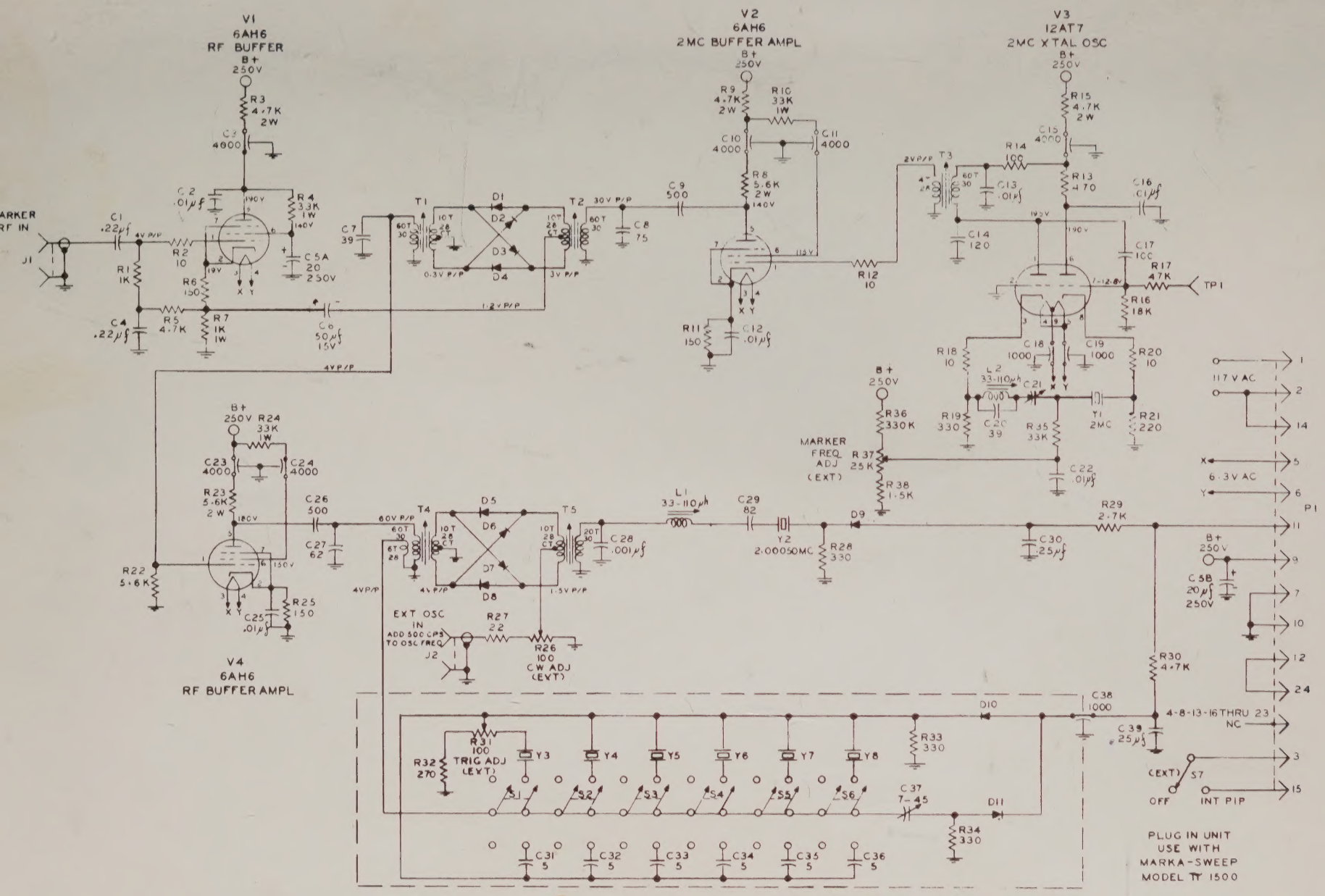


Fig. 5-2 PM-7632A SCHEMATIC, C-8361B